Chapter Review

Ratios and Proportions

1. *Ratios are basiclly fractions and proportions are equal ratios.*

2. *Key concept in proportions is the cross product. The means equal the extremes.*

3. *Proportions have interesting and useful properties.*

Properties of Proportions

$$\boxed{\frac{a}{b}=\frac{c}{d}} = \begin{cases} ad = bc & 1(6)=3(2) \\ \frac{a}{c}=\frac{b}{d} & \frac{1}{3}=\frac{2}{6} \\ \frac{b}{a}=\frac{d}{c} & \frac{2}{1}=\frac{6}{3} \\ \frac{a+b}{b}=\frac{c+d}{d} & \frac{1+2}{2}=\frac{3+6}{6} \end{cases}$$

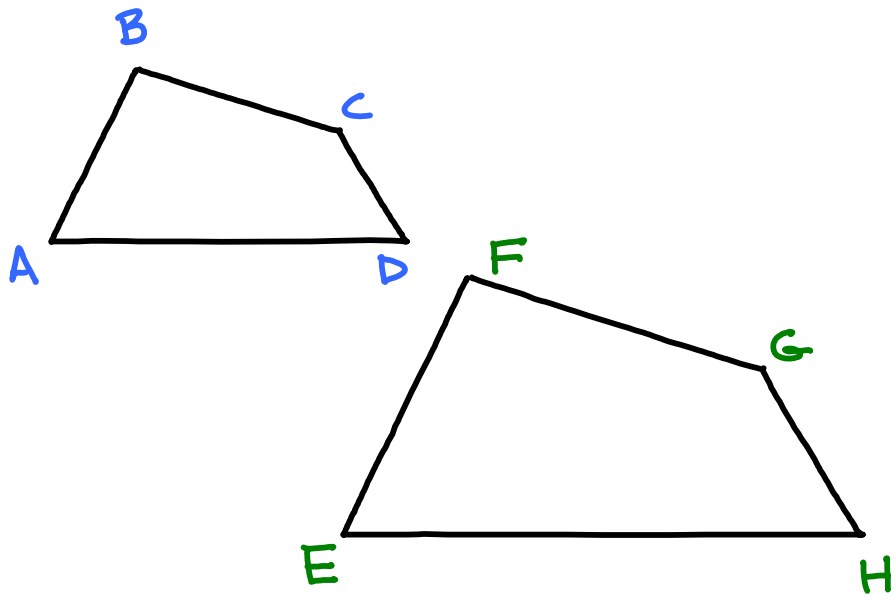
$$\frac{1}{2}=\frac{3}{6}$$

if $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\cdots$, then $\frac{a+c+e+\cdots}{b+d+f+\cdots}$

$$\frac{1}{2}=\frac{3}{6}=\frac{4}{8} = \frac{1+3+4}{2+6+8} = \frac{8}{16}=\frac{1}{2}$$

Similar Polygons

Similar Polygons....zoom in and zoom out

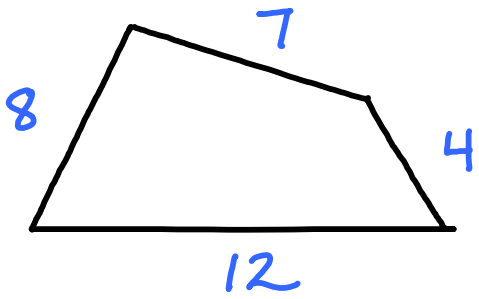


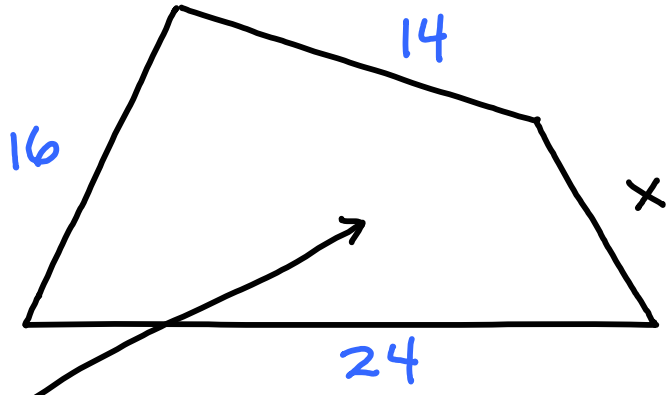
Two polygons are similar if they have:

* *corresponding angles that are congruent*
* *corresponding sides that are in proportion*

ABCD ~ EFGH

Similar polygon problems use ratios and proportions





$$\frac{7}{4} = \frac{14}{x}$$

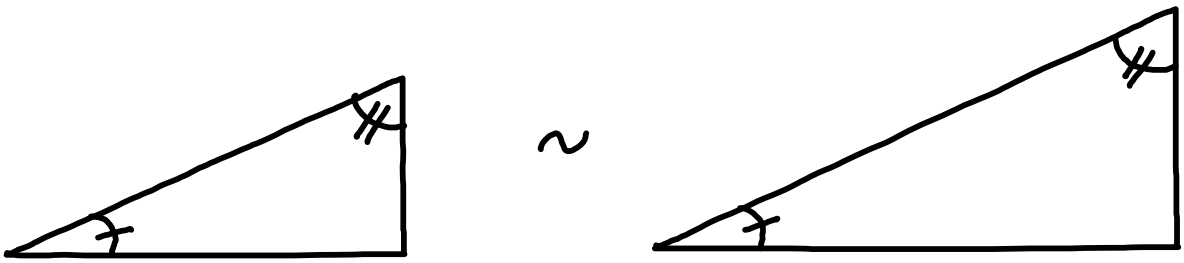
$$7x = 56$$

$$x = 8$$

Similar Triangles

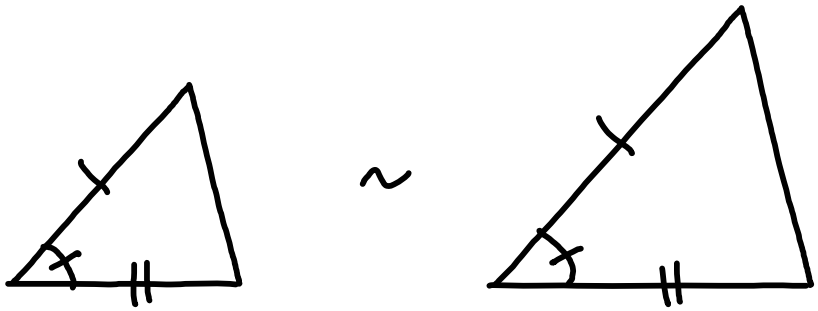
AA Similarity Postulate

If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar



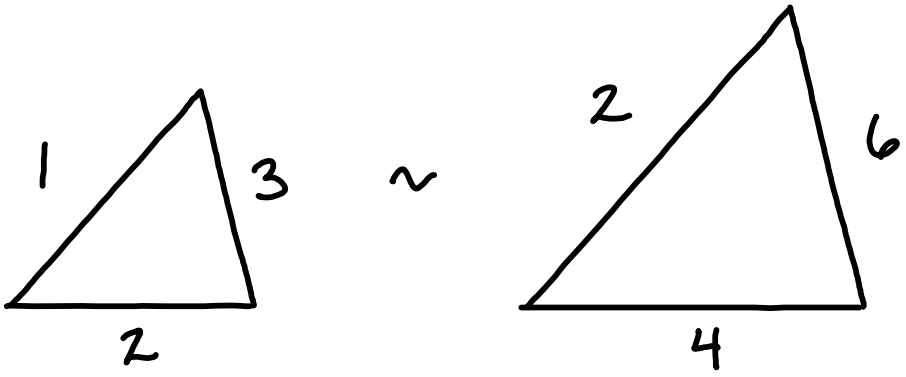
SAS Similarity Theorem

If an angle of one triangle is congruent to an angle of another triangle and the sides including those angles are in proportion, then the triangles are similar



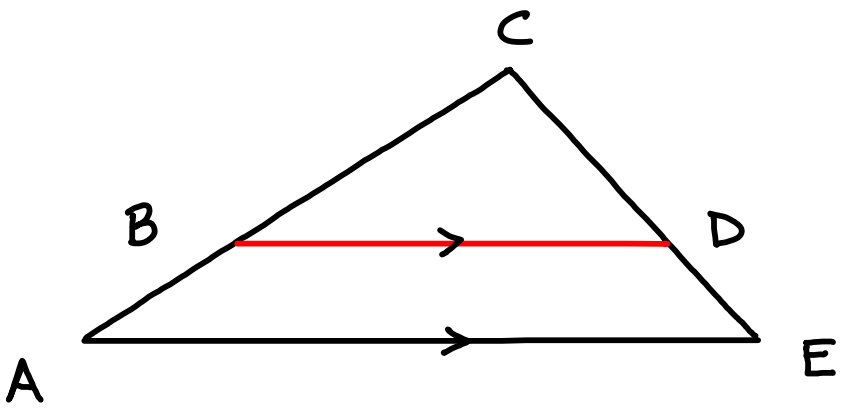
SSS Similarity Theorem

If the sides of two triangles are in proportion, then the triangles are similar



Triangle Proportionality Theorem

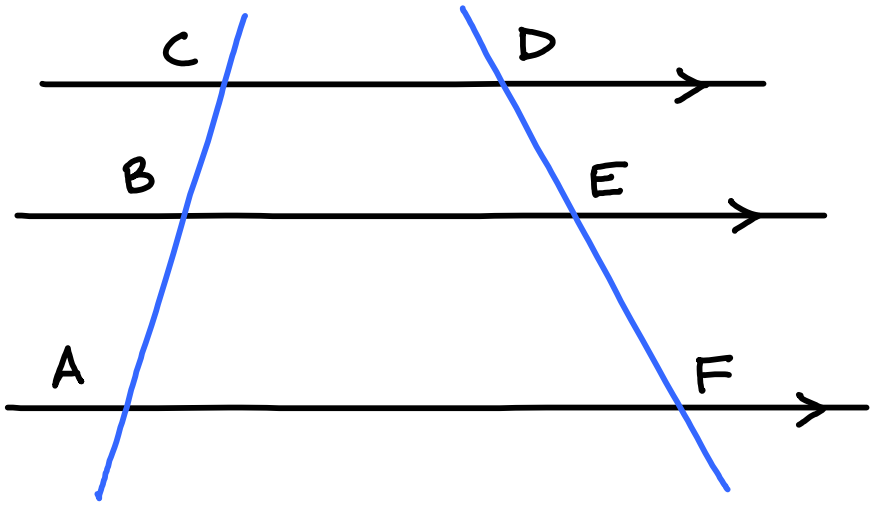
If a line parallel to one side of a triangle intersects the other two sides, then it divides those sides proportionally



$$\frac{AB}{BC} = \frac{DE}{CD}$$

Corollary *a statement that can be proved easily by applying a theorem*

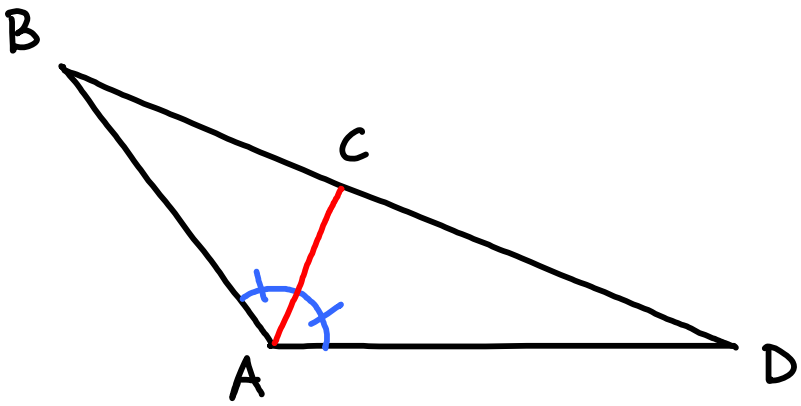
if three parallel lines intersect two transversals, then they divide the transversals proportionally



$$\frac{BC}{BA} = \frac{DE}{EF}$$

Triangle Angle-Bisector Theorem

If a ray bisects an angle of a triangle, then it divides the opposite side into segments proportional to the other two sides



$$\frac{CB}{CD} = \frac{AB}{AD}$$